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January 31, 1995

Nicholas Nigro
PRC Environmental
Management, Inc.
233 North Michigan Avenue
Suite 1621
Chicago, IL 60601

Dear Mr. Nigro:

As you requested, please find enclosed a copy of the text portion of the Chevron Terminal investigation by Law Environmental. It was performed as a part of Ashland's CERCLA due diligence work, prior to our purchase of the terminal. Also, included are The Oily Water Sewer Drawings, The Operations Narrative, and MSDS's for Asphalt Cement and Black Beauty Abrasive Grit.

Please let me know if the pre-acquisition report or other enclosures raise any questions that need addressed.

Sincerely,

R. L. Gray

RLG:jp

Enclosures

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1.0 INTRODUCTION

Ashland Petroleum Company is considering acquiring the Cincinnati Asphalt Refinery in North Bend, Ohio. This facility is presently owned by Chevron USA, Incorporated. The following background information was obtained during a meeting with Mr. Robert Gray and Mr. Robert Everett of Ashland Petroleum Company on March 13, 1991. The overall purpose of this investigation and site location and description are also discussed in this section.

1.1 Background

The facility began operation as a refinery in 1954, producing asphalt, kerosene, and naphtha. Since the mid-1960's the facility has served as a bulk terminal and processing facility for asphalt cements, emulsions and various asphalt based commercial products; however, refining operations were discontinued in 1965.

In addition, the facility has a boiler plant, laboratory, loading/offloading structure, product processing plants, maintenance shop, offices and other operating facilities. The laboratory reportedly used trichloroethene and 1,1,1-trichloroethane and other solvents as cleaners for certain test procedures. Bulk storage of these solvents were observed on a concrete pad adjacent to (outside) the laboratory in 55-gallon drums. A 1000-gallon underground storage tank for gasoline was removed in 1986. The plant is currently using two high-yield ground water production wells for cooling, steam and plant process water.

The facility's sanitary wastewater is disposed of into three septic systems; one at the locker/shower building, and two at the laboratory. Plant process waste water, cooling water, boiler blowdown and storm water is discharged to either the Ohio River or Dark Hollow Creek through three NPDES permitted outfalls. Process waters are treated in an oil-water separator, designated as "No. 3 separator," and other equipment prior to discharge.

There is a large lagoon which once was operated as a retention pond/oil separator, designated as "No. 1 separator," with a permitted outfall; however the lagoon is no longer in use and it's outfall is closed. Sludge from the No. 3 separator is disposed off-site. The facility ~~plant has a RCRA permit for these wastes and~~ is classified as a large-quantity generator.

Ammonia nitrate-nitrite contamination of ground water, which has resulted in degradation of the facility's production water supply, has been reported since 1979. Several investigations have been initiated to determine the extent of contamination and evaluate whether any portion of the site is capable of providing an uncontaminated source of production water.

In recent years, environmental studies have included the installation of monitoring wells and sampling and analysis of soils and ground water at the facility. Well logs obtained from previous reports are provided in Appendix A. It is reported that there are 17 functional ground-water monitoring wells on the site. Construction details of these existing monitoring wells are presented in Table 1. Previous investigations have indicated that soil and ground water at the facility contain volatile and semi-volatile organic compounds, ammonia and nitrate-nitrite. Chloride concentrations have also been detected in water samples from several monitoring wells.

1.2 Purpose

The purpose of this work was to provide Ashland Petroleum Company with a review of reports prepared for Chevron during previous environmental investigations and address several specific environmental concerns that have been identified by Ashland by confirming or denying the presence of contamination. These concerns include:

- Possible presence of hazardous sludge or contaminated soil in the former retention/separator lagoon (No. 1 separator).

- The character of sludges in the NPDES - permitted separator (No. 3 separator).
- Probable asphalt and product spills in several areas of the tank farm, where surface stains are present.
- Stockpiled soils from past tank farm grading.
- Documented mercury spills from broken manometers.
- An abandoned land-farm where tank bottoms and sludges were placed.
- Possible disposal of solvents from the laboratory to the ground and/or septic system.
- Ground-water contamination, identified in prior studies including nitrates/nitrites, ammonia, and chlorides.
- The potential for contamination of the property from several nearby industrial/chemical facilities.

1.3 Site Location and Description

Chevron's Cincinnati Asphalt Refinery is located at 11001 Brower Road in North Bend, Ohio, in the extreme southwest portion of the state (Figure 1). The facility is in an industrial area and is bounded by several manufacturing plants. These include an agrichemical plant and gun powder manufacturer to the northeast, an electric generating plant to the west and southwest and an abandoned wood-treating facility to the northeast.

The refinery is bordered to the north by Brower Road and by the Ohio River to the south. The Baltimore and Ohio Railroad crosses the site from east to west and separates the facility into northern and southern sections. Presently, approximately 100 above-ground storage tanks and about 100 acres of undeveloped, wooded land are included on the refinery property. Figures 2 and 2A are a site plan of the refinery.

2.0 SCOPE OF WORK

To achieve the goals of this investigation, Ashland supplied us with reports of previous investigations at the refinery for review. In addition to these reviews we performed a site walkover, reviewed aerial photographs and sampled shallow soil, ground water, surface water and sludge for chemical analysis. Field activities at the site were conducted from April 9 to April 17, 1991.

2.1 Review of Previous Reports

Three reports that were prepared for Chevron by other consultants were reviewed. These reports are:

- Ground-Water Quality Assessment and Ground-Water Supply Evaluation, prepared by Geraghty & Miller Hydrocarbon Services, Inc. (GMHS) in April, 1989.
- Environmental Assessment Report, prepared by Engineering-Science (E-S) in January, 1991.
- Environmental Closure Study on Old API Separator Lagoon located at Chevron Asphalt Plant, North Bend, Ohio prepared by the H. C. Nutting Company in May, 1985.

2.2 Site Walkover and Aerial Photograph Review

A preliminary walkover of the site was conducted on April 9, 1991. During this walkover, sampling locations were identified for us by Mr. Robert Gray of Ashland Petroleum Company. Mr. Brad Lambert, also of Ashland, identified several additional, potential sampling locations and areas of interest on April 10, 1991. Additional information pertaining to the refinery's past and present operational practices was obtained mainly from Chevron personnel.

Ashland provided us with aerial photographs of the site which show the site at various stages of development betweem August 20, 1938 and May 30, 1989. These photographs were reviewed in an attempt to identify features which may help explain current environmental conditions at the site and to evaluate whether further investigation is warranted.

2.3 Ground-Water Sampling Procedures

Ground-water samples were collected from 14 monitoring wells (MW-1, MW-2, MW-6, MW-8, MW-9 through MW-15, B-4 and B-7), the west and south production wells, a tank which is supplied by the Cleves municipal water supply, a steam tank and the kitchen sink in the main office. These sampling locations are shown on Figures 3 and 3A.

Ground-water sampling techniques are not standardized. The procedures used were based on guidelines presented in the U.S. EPA RCRA Technical Enforcement Guidance Document of September 1986. Because sampling procedures may affect analytical results; it is imperative that consistency be a primary element of the sampling process. Field personnel were trained in the techniques and procedures involved in sampling and reported any problems with or variance from these procedures.

2.3.1 Logbooks

Field books, well development forms (Appendix B), field sampling reports (Appendix C) and laboratory logbooks were maintained throughout the sampling and analysis period. These records provide documentation of procedures used, observations made, results obtained, and pertinent logistical information.

Field books, well development forms and filed sampling reports include the following information:

- Well identification
- Static water-level elevation measurement procedure
- Total depth of well
- Well evacuation/purging procedure
- Purge volume and rate
- Time well was purged
- Well yield
- Sample withdrawal procedure and equipment
- Date and time of sample collection
- Well sampling sequence
- Types of sample containers and sample identification numbers
- Preservatives used
- Analyses requested
- Field analyses results and methods
- Sample distribution and transporter
- Miscellaneous field observations:
  - unusual odor, color, or change in color of sample after collection
  - equipment malfunctions
  - possible sample contamination
- Collectors name(s)
- Weather conditions at time of sampling

The laboratory logbook documented processing steps applied to the sample and provided a chronology of its route through the laboratory work stream. The analysts' names were also recorded. In general, the laboratory logbook provides the following information;

- Sample preparation techniques
- Instrumental methods
- Experimental conditions
- The identification of and analytical results from all laboratory blanks and quality control samples.

2.3.2 Cleaning Field Equipment

Sampling equipment was cleaned and dried prior to use at each well location unless dedicated equipment was used. These types of field equipment included bailers, attendant bailer lines and water level measuring equipment. Sampling equipment was cleaned using the following protocol when volatile and semi-volatile organic compounds were the parameters of interest:

1) Laboratory grade soap wash
2) Distilled, deionized water rinse
3) Isopropanol rinse
4) Pesticide grade hexane rinse
5) Distilled, deionized water rinse

The cleaning sequence employed for samples in which metals were the analytes of interest, is as follows:

1) Laboratory grade soap wash
2) Distilled, deionized water rinse
3) 0.1N $HN0_3$ rinse
4) Distilled, deionized water rinse

2.3.3 Contamination Abatement

The following policies (in conjunction with the cleansing procedures previously specified) contributed to preservation of sample integrity:

- Sample collection progressed from least contaminated to most contaminated areas, if known.

- Each sample was gathered using cleaned, dedicated bailers.
- One duplicate sample was gathered during the sampling event.

2.3.4 Water Level Measurements

A measurement of the static ground-water level in the well was made prior to sampling. An electronic water level recorder was used and measurements were taken to the nearest 0.01 foot relative to the top of the well casing. The elevations of the top of each well casing were obtained from reports previously submitted by GMHS and E-S. The total depth of the well was also gauged to the nearest 0.01 foot prior to sampling.

2.3.5 Well Evacuation/Purging Procedures

Fluid stored within the well casing and filter pack prior to sampling is usually not representative of in-situ ground-water quality. The wells were purged in order to draw fresh formation water into the well casing, promoting collection of a representative sample. Temperature, pH, and specific conductance measurements were recorded during purging. These measurements were obtained at a frequency of at least one per well volume. Purging continued until these parameters stabilized and at least 3 times the measured volume of standing water in the well and filter pack were removed to promote collection of a representative sample. Well purging/evacuation procedures were recorded on a field sampling sheet.

Well water was removed with dedicated, bottom-valve bailers with disposable polypropylene line. Both bailer and bailer line were handled so that no contact was made with the ground. As an extra precaution against contamination, disposable plastic sheeting was spread on the ground surface around each well. Fluids removed from the wells were placed in used drums that were provided by Chevron. Chevron personnel were responsible for discharging these fluids through their water treatment system. Sampling of the east and

west production wells, the tank containing water from the Cleves municipal water supply, the steam tank and kitchen sink were collected after letting the tap (point of sampling) run for approximately 30 minutes.

2.3.6 Field Analyses

Physically and/or chemically unstable parameters such as temperature, pH, and specific conductance were evaluated in the field during and after well purging/evacuation activities. Field analyses were conducted in accordance with SW-846, 3rd edition methods; instrument calibration was performed daily, prior to taking measurements, according to manufacturers' specifications and consistent with SW-846. Measurements of temperature, pH and specific conductance were taken on portions of the formation fluids withdrawn by bailer from the well. Measurement procedures and results, calibration practices, date and time were recorded in the field logbook.

2.3.7 Sample Procurement and Preservation

Ground water samples were acquired within 24 hours after the purging and field analyses were completed. Samples were of the grab type and were obtained with dedicated, bottom-valve high density polyethylene (HDPE) bailers. Neither bailer nor attendant line contacted the ground prior to sampling.

Samples were transferred directly to appropriate containers as indicated by Table II of 40 CFR 136, using precautions to not excessively agitate/aerate the fluid. Sample containers were provided by the laboratory and were cleaned in accordance with standard procedures.

Sample containers were labeled (by the laboratory) to reflect the specific parameter for which the sample was analyzed; this scheme matched any preservatives that were pre-emplaced by the laboratory with the appropriate parameter according to the collection

sequence. The EPA Technical Enforcement Guidance Document suggests collection and containment sequence for assessed ground-water parameters is as follows:

- Volatile organics (VOA)
- Purgeable organic carbon (POC)
- Purgeable organic halogens (POX)
- Total organic halogens (TOX)
- Total organic carbon (TOC)
- Extractable organics
- Total metals
- Dissolved metals
- Phenols
- Cyanide
- Sulfate and Chloride
- Turbidity
- Nitrate and ammonia
- Radionuclides

If this was followed then say so.

In accordance with EPA's SW-846, 3rd edition, samples were cooled to approximately 4° C and protected from light. Procedures and observations were recorded in the field sampling report or logbook. The well sampling sequence was also noted.

2.3.8 Sample Containers

Sample containers were provided by the laboratory. In general, sample containers were PTFE (teflon) or polyethylene when metals were the analyses of interest and glass with PTFE (teflon)-lined caps when volatile organic compounds were the analyses of interest. Amber-colored glass containers were used for semi-volatile organic compound and total petroleum fuel hydrocarbon (TPFH) samples.

Sample containers were labeled in a legible fashion that remained clear even when wet. Labels, at minimum, exhibited the following information:

- Sample identification number
- Data and time of collection
- Analyses required
- Collector's name(s)

Samples that were shipped to the laboratory by independent means (e.g., air freight, UPS, etc.) were transported in shipping containers that were properly refrigerated and sealed to maintain sample integrity. Shipping containers were appropriately labeled and conformed to DOT standards.

2.3.9 Sample Analysis Request Forms

A sample analysis request form accompanied samples to the laboratory and contained a clear record of the following:

- Name of person receiving the sample
- Laboratory sample number (if different from field number)
- Date of sample receipt
- Requested analyses
- Internal temperature of shipping vessel upon opening in the laboratory

2.3.10 Chain-Of-Custody Program

The chain-of-custody program facilitated the tracing of sample possession and handling from field collection through laboratory analyses. The chain-of-custody program consisted of field and laboratory logbooks, sample labels, sample seals, and sample analysis request forms (all of which have been documented in previous sections) as well as chain-of-custody record.

The chain-of-custody record enables sample history to be determined and one accompanied each sample or lot of samples. The following information was recorded:

- Sample number
- Name/signature of collector
- Date and time of collection
- Sample type (e.g., ground-water, floater, etc.)
- Well identification
- Number of containers
- Analyses requested
- Name/signature of person(s) involved in the chain-of-possession

2.4 Soil Sampling Procedures

Soil sampling was conducted in accordance with *Methods for Evaluating Solid Wastes*, EPA SW-846. Soil samples were collected at 34 locations on the refinery property (Figures 3 and 3A).

2.4.1 Logbooks

A fieldbook, field sampling reports (Appendix C) and laboratory logbooks were maintained throughout the sampling and analysis period. These records provide documentation of procedures used, observations made, results obtained and pertinent logistical information.

The field book and field sampling reports include the following:

- Sample identification
- Sampling date and time
- Sampling procedure and equipment
- Types of sample containers
- Sample distribution and transporter
- Miscellaneous field observations
- Collector(s) name(s)
- Weather conditions at time of sampling

The laboratory logbook documented the same information as was recorded for groundwater samples (Section 2.3.1).

2.4.2 Cleaning Field Equipment

Stainless steel hand augers, spoons and mixing bowls were used to obtain soil samples. Equipment was thoroughly cleaned and dried prior to use at each sampling location. Decontamination procedures were previously discussed in section 2.3.2.

2.4.3 Sample Procurement and Preservation

Grass and/or gravel was removed from the surface prior to sampling. Stainless steel hand augers or spoons were then used to excavate to the predetermined sampling depth. Sampling depths ranged from the surface to 8 feet below ground level.

When soil was removed from the appropriate sampling depth, sample material intended for volatile organic compound analysis was immediately placed into appropriate containers and sealed. An 8 ounce soil jar was approximately half filled (as quickly as possible), covered with aluminum foil and capped with a screw-on-lid. This sample was reserved for headspace analysis. During this procedure, samples are placed in a warm setting (e.g. sun) in order to let organic vapors volatilize into the remaining headspace in the jar. The sample cap is then removed and the probe of a photoionization detector (HNU with an 11.7 eV lamp) is inserted through the foil. The number of meter deflection units were then recorded in the field book.

The remaining sample material was then placed into a stainless steel bowl. After thoroughly mixing the sample with stainless steel spoons, each of the remaining sample containers were filled. A duplicate sample was collected (location SO-10) to document the preservation of sample integrity. Sample containers were labeled (by the laboratory)

to reflect the specific parameter that the sample yielded. In accordance with SW-846, samples were chilled to approximately 4°C (packed on ice) and protected from light. Procedures and observations were recorded in the field book or on field sampling reports.

2.4.4 Sample Containers

Sample containers were provided by the laboratory. In general, sample containers were glass with teflon-septa caps when volatile organic compounds were the parameters of interest and glass with teflon or polyethylene-lined caps when other constituents were the parameters of interest.

Sample containers were labeled in the same manner as was discussed in section 2.3.8 for ground-water samples.

2.4.5 Sample Analysis Request Forms and Chain-of-Custody Program

The discussions of sample analysis request forms and the chain-of-custody program presented in sections 2.3.9 and 2.3.10, respectively apply to the processing of soil samples for laboratory analyses.

2.5 Surface Water Sampling Procedures

Surface water sampling and analysis protocol was in accordance with *Methods for Evaluating Solid Wastes*, EPA SW-846. Samples were collected from the north and south NPDES permitted outfalls. A sample of surface water sheen, observed floating on Dark Hollow Creek (approximately 50 feet north of the northern NPDES discharge point) was also collected. Surface water sample locations are included on Figures 3 and 3A.

Effluent samples were collected from the NPDES permitted outfalls by submerging the sampling bottles. Care was taken to avoid unnecessary agitation of the water being sampled. The surface water sample of Dark Hollow Creek was obtained by skimming the surface sheen with the sample bottles.

Specific details concerning logbooks (documentation), sample procurement and preservation, sample containers, sample analysis request forms and the chain-of-custody program and identical to those employed during ground-water sampling and are presented in section 2.3.

2.6 Sludge Sampling Procedures

Sludge samples were collected from the mechanical separator, the parshall flume at the northern NPDES permitted outfall and from the east and west sides of the submerged separator in the lagoon. Sludge sampling locations are included on Figures 3 and 3A.

Sludge samples were obtained using a stainless steel ladle attached to a steel extension rod. Specific details concerning logbooks (documentation), equipment cleaning, sample procurement and preservation, sample containers, sample analysis request forms and the chain-of-custody program are identical to those employed during soil sampling and are presented in section 2.4.

2.7 Laboratory Analysis

Samples were analyzed at Law Environmental National Laboratories (LENL) in Kennesaw, Georgia. Analyses performed on ground-water, surface water and sludge samples are presented in Table 3. Analyses performed on soil samples are presented in Table 2. Analytical methods employed by LENL are summarized in Table 4.

3.0 RESULTS

3.1 Previous Investigations

Several previous investigations have been performed at the facility. Since ammonia was detected in site ground water prior to July 1979, six consultants have reportedly prepared seven reports relative to ground-water quality, alternative water supply sources, and the character of excavated soils. Previous investigations have speculated that ammonia contamination of the ground water at the site may be attributable to an adjacent agri-chemical facility.

Twenty-five monitoring wells have reportedly been installed at the site. All of the wells have been installed in the unconsolidated sand and gravel aquifer and range in depth from 16.5 to 119 feet below ground level. Four production wells have been installed at the site. Two of these wells (west and south) are used to produce ground water at a pumping rate on the order of 300 gallons per minute.

Three of the previous reports were provided to Law Environmental for review. These documents are:

1) Ground-Water Quality Assessment and Ground-Water Supply Evaluation prepared by Geraghty and Miller Hydrocarbon Services, Inc. (GMHS) in April 1989

2) Environmental Assessment Report, Chevron U.S.A., Inc., Cincinnati Asphalt Refinery, prepared by Engineering-Science in January 1991

3) Environmental Closure Study on Old API Separator Lagoon located at Chevron Asphalt Plant, North Bend, Ohio prepared by the H.C. Nutting Company in May 1985.

The GMHS report stated that ammonia contamination of the ground water at Chevron's Cincinnati Asphalt Terminal had been detected since 1979 and has resulted in degradation of the plant water supply. The objectives of GMHS's study were to:

1) Assess ground-water quality

2) Confirm potential for development of a suitable on-site production water supply

3) Make recommendations concerning development of a production water supply

To address the above stated objectives GMHS

- installed monitoring wells MW-1, MW-2, and MW-3
- sampled and analyzed soils during monitoring well drilling
- sampled and analyzed new and existing monitoring wells

GMHS found that the existing production wells are contaminated with high levels of ammonia and nitrate-nitrite. GMHS estimated aquifer transmissivity to be approximately 40,000 gallons per day per foot (gpd/ft). This value is significantly lower than an estimate of 170,000 gpd/ft reported by Engineering-Science in 1991.

GMHS concluded that ground-water contamination (nitrate-nitrite) exists in the southern portion of the site and that withdrawal of water from the southern portion of the site may lead to degradation of the quality of ground water in that area. GMHS also concluded that ground-water flow direction in the alluvial aquifer at the site changes periodically or seasonally in response to changes in river elevation.

GMHS recommended that:

- production wells should not be located on the southern portion of the site
- previously suggested alternatives including an off-site water supply and withdrawal from the river may merit further consideration
- Remediation of ground-water contamination at the site should be considered
- Further studies should include investigation of the adjacent agri-chemical facility

The Engineering-Science (E-S) report documents additional assessment work which was undertaken at the site. This work was initiated in response to Chevron's desire to sell the property. E-S was retained by Chevron to "conduct a thorough soil and ground-water quality assessment at the site prior to any potential property transfer" the purpose of which was to collect additional data on the quality of the soils and ground water beneath the site. E-S addressed their objectives through the installation and sampling/laboratory analysis of 12 on-site monitoring wells. Soil samples from the well bores and water samples from the wells were collected for laboratory analyses.

Engineering-Science's report includes data that generally confirms the findings reported by GMHS in 1989. Additionally, E-S concurs with GMHS's interpretation that the alluvial aquifer is periodically or seasonally recharged by the Ohio River. The E-S report also generally agreed with the conclusions provided by GMHS.

The H.C. Nutting report addresses a sampling program which was conducted in 1985 at the old separator lagoon. The study was apparently undertaken to characterize lagoon bottom materials prior to closure of the unit. The report constitutes a data submittal and summary of sampling technique/protocol employed.

3.2 Site Walkover and Aerial Photograph Review

Aerial photographs from nine different time periods were obtained for review. The quality of the photographs varied ranging from high quality - high resolution to paper copies of the original photograph with poor resolution and unknown scale. Dates of the existing photographs ranged from August, 1938 to May, 1989. Reliability of the dates varied as several dates were only hand written on the photograph. A summary of the existing photographic information, the date, phototype (photo or paper copy) and scale if known is provided below:

Date	Photograph Type	Scale	Control
8-20-1938	paper	--	--
5-1-1951	paper	--	--
1961	photograph	1 in = 200 ft	City Survey, sheet numbers 38 & 39
5-31-1967	photograph	1 in = 587 ft	26-181, 26-182
9-11-1968	paper	--	BCH-4CC-161
8-18-1977	photograph		GS - VEJA
3-29-1986	photograph	1 in = 1000 ft	152.20 No. 21 01
1987	paper	--	--
5-39-1989	photograph	--	CXC - 1C - 76 to 78

Pre Plant Construction

The 1938 and 1951 copies of photographs show the area prior to construction of the facility. In the 1938 photo the northern portion of the site is primarily wooded. A cleared area with what may be a small farm with several small buildings is apparent with an entrance road through the woods from the west. Another clearing used for unknown purposes is identified on what is now the lagoon area. The land associated with the southern portion of the site appears to be agricultural. The Cincinnati Gas & Electric Power plant and the Koppers Wood Treatment facility (creosote plant) are present in both photos to the south and east of the main site respectively.

1960s

The 1961, 1967 and 1968 photographs identify the asphalt refinery with little change overtime. Observed additions to the facility from 1961 to 1968 include tank T-321, a current kerosene tank, and the large warehouse facility located east of the mill room. A clear area is present at the location of the current stockpile area in the 1962 photo, however the route back to this area is not well defined. This area could not be evaluated on the 1968 photo as it is outside the photo coverage. Outlines of what may be brine ponds appear to the east of the packaging warehouse on the 1968 photo. Small shrubs and/or sparse small trees appear to constitute the vegetation of the unused northern portion of the site. This lack of vegetation may be due to the time of year of the photography. The southern portion of the site is relatively unchanged over this time period. This area includes six aboveground storage tanks, associated piping, a docking facility on the Ohio River and an agricultural field. The Koppers facility appears to have scaled back the size of its operation from the previous photos.

1970s

Little change for the asphalt facility is evident on the August, 1977 photo. The northern portion of the site is heavily vegetated with trees allowing for a clear definition of the stockpile area and associated access road. An unidentified feature, possibly a blemish in the photo is located on the west central portion of the agricultural field in the southern portion of the site. The creosote plant is identified on the photo and appears to be operating.

1980s

Little change to the asphalt terminal is evident on the air photos taken in the 1980s. The May, 1986 photo shows the creosote plant is no longer in operation.

3.3 Geologic Setting

The surficial geology in the vicinity of the site is composed of approximately 100 feet of alluvial deposits associated with the Ohio River and/or its tributaries. The upper 50 feet is composed of yellow-grey to brown clay, silt, and sand and gravel. The lower alluvial sediments consist mainly of sand and gravel with pebbles from nearby rocks. (Engineering Science, 1991).

Bedrock in the area consists of the lower Eden or upper Utica Formation of Ordovician age. These formations are composed of calcareous bluish to greenish gray shales with minor amounts of the calcareous limestone. Top of rock is reported to be at approximately 400 feet elevation.

3.4 Hydrogeologic Setting

The Chevron Cincinnati Asphalt Terminal is located near North Bend, Ohio on the deeply entrenched Lexington Peneplain, on the terraced Ohio River flood plain. Ground water in the area is found in the alluvial sand and gravel deposits associated with the Ohio River. Depth to ground water varies with proximity to the Ohio River and ranges from approximately 20 to 50 ft. Ground-water flow direction has been reported toward the Ohio River (southeast). A flow reversal with reported ground-water flow to the northwest has also been reported (Engineering Science, 1991). Changes in flow direction are probably associated with river stage. Depth to ground water on the site ranges from approximately 20 feet below ground surface in the southern portion of the site near the river, to 40 to 50

feet in the north portion. Prior hydrogeologic tests of an on-site production well have reported transmissivities ranging from 40,000 to 170,000 gallons per day per foot (gpd/ft) (Geraghty and Miller, April 89) and hydraulic conductivities from 60 to 100 feet per day (ft/day).

No significant quantities of ground water are available from the bedrock in the area (Stout, 1943).

3.5 Water Level Measurements and Organic Vapor Analysis

Water level measurements were taken over several days from April 10, 1991 to April 16, 1991 from the sampled wells as described in Section 2.3.4 of this report. Water levels were not taken on a single day because of changes in the scope of services as the work progressed. Accordingly, a potentiometric surface map has not been prepared for this phase of investigation. Results of the measurements are presented in Table 5. Ground-water elevations ranged from 458.79 feet NGVD (National Geodetic Vertical Datum of 1929) to 462.33 feet NGVD. The wells have 16 to 69 feet of screen, which makes the accurate interpretation of ground-water flow direction difficult. In general, the regional direction of ground-water flow is toward the Ohio River, while local ground-water flow is likely diverted toward on-site production wells.

Organic vapor analysis of collected soil samples was performed utilizing headspace screening methods as discussed in Section 2.4.3 of this report. Results of the analyses are presented in Table 6. The highest readings were recorded in stained soil areas around Tank No's 401 and 501, which were 120 and 89 meter deflection units, respectively. The locations of samples are shown on Figures 3 and 3A.

3.6 Ground-Water Chemistry

Ground-water samples from 14 monitoring wells were collected and analyzed as described in Section 2.3. Ground-water sample analytical results which were above practical quantitation limits are presented in Table 7. The locations of the wells are shown on Figures 3 and 3A. Well development data, field sampling reports, and laboratory test reports are included as Appendices B, C, and D, respectively.

As shown in Table 7, federal drinking water standards have been exceeded for nitrate-nitrite, lead, and trichloroethene. Exceedences for nitrate-nitrite were detected in samples from wells MW-1, MW-2, MW-6, MW-8, MW-9, MW-10, MW-13, south well, and west well. An exceedence for lead was detected in the sample from well B-4 with a level of 0.080 mg/l. Exceedences for trichloroethene were detected in the samples from MW-9 and MW-10 with levels of 6 and 96 ug/l, respectively.

3.7 Soil Chemistry

Soil samples from 34 locations were collected and analyzed as described in Section 2.4. Soil sample results which were above practical quantitation limits are presented in Table 8. The locations of the samples are shown on Figures 3 and 3A. The laboratory test reports are included as Appendix E. Semi-volatile organic compounds were detected throughout the facility, with the highest levels located in the removed tank area and the area of tank 501. In particular bis (2-ethylhexyl) phthalate was prevalent throughout the facility. Several volatile organic compounds were found at various quantities and locations. In addition to being detected in ground water, TCE was also detected in the soils in the laboratory leach field. The highest volatile organic compound concentration was total xylene at 3600 ug/kg in the piping trench. Elevated levels of lead were also detected in samples from the piping trench. Metals were encountered at various quantities and locations; total mercury was detected at both the north and south manometers at 0.3 to 19 percent by weight.

3.8 Sludge and Surface Water Chemistry

Surface water samples were collected from three areas as described in Section 2.5. The surface water sample results which were above practical quantitation limits (PQL's) are presented in Table 9 and the laboratory test reports are included as Appendix F. For all three sampling points chloride, ammonia and nitrate-nitrite were above PQL's. Nitrate-nitrite was above federal drinking water standards at the North-NPDES outfall and in Dark Hollow Creek with levels of 200 and 160 mg/l, respectively. Bis (2-ethylhexyl) phthalate was detected at the North-NPDES outfall and in Dark Hollow Creek.

Sludge samples were collected from four locations as described in Section 2.6. Sludge sample results which were above practical quantitation limits are presented in Table 10 and the laboratory test reports are included in Appendix G. Total petroleum fuel hydrocarbons were found at all locations, and several semi-volatile compounds were detected at the North-NPDES outfall and the oil water separator. Several volatile organic compounds were found in various quantities and locations; in particular, methylene chloride was detected in all samples at concentrations ranging from 300 ug/kg in the Lagoon-West sample to 21000 ug/kg in the Lagoon-East sample. The separator sludge sample (SL-2) shows elevated levels of both semi-volatiles and volatiles.

4.0 SUMMARY AND CONCLUSIONS

Based on review of the documents provided and on the data obtained from this study, the following summations and conclusions have been developed.

- Silty sands and gravels of unconsolidated alluvial material underlies the site to a depth of approximately 50 feet. Sand and gravel extends from approximately 50 feet below grade to top of rock. Rock has not been encountered during drilling activities at the site.

- Bedrock at the site is likely composed of shales as indicated by well logs for water wells drilled in the area. Top of bedrock is estimated to be approximately 100 to 130 feet below the surface at the site.

- The alluvial aquifer beneath the site is one of the highest producing ground-water sources in the Hamilton county area and is reportedly the only aquifer capable of producing ground water in quantities sufficient for industrial use.

- Previous estimates of the transmissivity (T) of the aquifer at the site have ranged from 40,000 gpd/ft to 170,000 gpd/ft.

- Ground-water flow direction at the site apparently changes periodically or seasonally. This is a common phenomenon in alluvial aquifers located in a ground-water discharge area such as a river valley, particularly where river elevation is controlled and can rise significantly. However, since measurements were obtained on different dates and wells are not screened similarly, this interpretation is subject to modification based on collection of new data.

- Contamination is present in site soils and ground water.

- Mercury contamination is prevalent in site soils in the vicinity of two broken manometers. Mercury has been detected 105 feet from the northern manometer in ditch sediments along the road.

Petro Exclusion

- Diesel fuel constituents are present in the shallow soil at several locations.

- Volatile and semi-volatile organic contaminants are present across the site.

- Limited information is available concerning the potential for contamination at adjacent sites. (i.e. Kaiser-Vigoro, Koppers Company, Atlas Powder Company, Cincinnati Gas & Electric). There is a possibility of significant contamination from these plants.

- TCLP results of stockpile samples indicate that this material is not classified as hazardous under RCRA (40 CFR 261.24).

- Chloride was detected in ground-water and shallow soil samples.

- Trichloroethene is present in the vicinity of the leach field adjacent to the laboratory. Ground-water samples collected from MW-9 and MW-10 contained trichloroethene. Chloride concentrations were elevated in ground water at this location, as well.

- The oil/water separator appears to be accumulating a variety of organics and inorganics.

- The horizontal and vertical extent of contamination have not been defined in soil or ground water at the site.

- Construction of current ground-water monitoring wells at the site which utilize more than 5 or 10 feet of screen does not permit limited interval sampling and analysis of ground-water quality. Detected values likely are not representative of water quality at specific elevations/zones in the aquifer. Existing well completions where up to 70 feet of screen is used may constitute an environmental liability.

- A suitable site water supply does not exist at this time. High ammonia and nitrate-nitrite concentrations in the current supply require costly treatment and it is possible that uncontaminated water may not be available within the plant boundaries.

- Solvents detected in soils and ground water continue to be used at the site.

- The laboratory septic drain field, old separator lagoon, mercury spill areas and the old landfarm could be regulated units under RCRA.

5.0 RECOMMENDATIONS

Based on our review of the data and the summary and conclusions presented in Section 4.0, the following recommendations have been developed.

- Develop work plan to characterize/assess site soil and ground-water quality sufficiently to define the horizontal and vertical extent of contamination. The work plan should address abandonment of selected existing monitoring wells and replacement with a monitoring well system capable of defining the horizontal and vertical extent of ground-water contamination from on-site and off-site sources.

- Perform total metals analysis and full TCLP on a separator sludge sample in accordance with SW-846 for hazardous waste determination.

- Develop information regarding environmental status of adjacent sites.

- Develop information concerning general water quality of the alluvial aquifer.

- Based on results of additional assessment, evaluate the regulatory status of the site and establish a long-term regulatory strategy.

- Based on results of the regulatory status evaluation, evaluate need for remediation action at the site. Perform remedial alternatives evaluation.

- Develop and implement work plan for applicable remedial action.

- Investigate chloride levels in soil and ground water near the site to evaluate natural/background chloride levels. Investigate the old brine pits and use of rock salt at the site.

- Pump tests should be performed on the existing production wells. Evaluate whether the existing monitoring wells can be used as data points during the pump tests.

6.0 REFERENCES CITED

Engineering-Science. 1991. Environmental Assessment Report: Chevron's Cincinnati Asphalt Refinery. Consulting report to Chevron U.S.A., Inc.

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H.C. Nutting Company. 1985. Environmental Closure Study on Old API Separator Lagoon, Chevron Asphalt Plant, North Bend, Ohio. Consulting Report to Chevron U.S.A., Inc.

Stout, W. and others. 1943. Geology of Water in Ohio, Bulletin 44, Ohio Department of Natural Resources, Division of Geological Survey.

USEPA, 1986. RCRA Ground-Water Monitoring Technical Enforcement Guidance Document. Waste Management Division Office of Solid Waste. United States Environmental Protection Agency. Washington, D.C.

USEPA, 1982. Test Methods for evaluating Solid Waste: Laboratory Manual SW-846, 3rd Edtion.

REED MINERALS

MATERIAL SAFETY DATA SHEET

(Complies with 29 CFR 1910.1200)

SECTION I - GENERAL

Reed Minerals
A Division Of Harsco Corporation
8149 C Kennedy Avenue
Highland, IN 46322
Emergency Telephone Number: (219) 923-4200

Product Name: Black Beauty(R) Abrasives
CAS Number: 68476-96-0
Particulates not otherwise regulated.
Common Name: Boiler Slag
Date: April 15, 1987
Revised: August 1, 1988
2nd Revision: September 1, 1989

SECTION II - INGREDIENTS

		OSHA *PEL	ACGIH *TLV
Boiler Slag 100% (Typically as an amorphous mixture of Fe,Al,Ca silicates)	Nuisance Dust		
	Total Dust :	15	10
	Respirable Dust:	5	5

*Values Expressed as mg/m3

SECTION III - PHYSICAL DATA

Physical Form	:	Solid (angular granules)
Boiling Temperature	:	N/A
Melting Temperature	:	greater than 2300 Deg F
Vapor Pressure/Density	:	N/A
Evaporation Rate	:	N/A
Specific Gravity	:	2.7 g/cc (typical)
Water Solubility	:	Negligible
Color	:	Black
Odor	:	None

SECTION IV - FIRE AND EXPLOSION DATA

Product is non-flammable and non-explosive.

SECTION V - REACTIVITY DATA

Product is stable under normal conditions of use, storage, and transportation.

SECTION VI - HEALTH HAZARD DATA

Low health risk by inhalation. Treat as a nuisance dust. Typical free silica less than 0.1%. Human toxic response has not been demonstrated for any route of entry. Mechanical irritation may occur to eyes, skin, or respiratory tract. Pre-existing health conditions may be aggravated.

Carcinogenicity:	NTP	-	No
	IARC Monographs	-	No
	OSHA Regulated	-	No

FIRST AID

In case of:

1. Eye contact - Immediately flush eyes thoroughly with water.
2. Skin contact - Wash skin with soap and water if irritation occurs.
3. Inhalation - Remove affected person(s) to fresh air source.
4. Oral intake - Rinse mouth out with water.

If symptoms persist, contact a physician or other medical personnel.

SECTION VII - SPILL, LEAK, AND DISPOSAL PROCEDURES

No special procedures required for clean-up. Wetting with water will reduce airborne dust. Uncontaminated product does not exhibit characteristic EP Toxicity and may be disposed of as inert material in an appropriate solid waste landfill according to applicable Federal, State, and Local regulations.

SECTION VIII - CONTROL MEASURES

Use appropriate NIOSH certified respiratory protection when exposure limits may be exceeded. Maintain sufficient ventilation to allow visual contact with work surfaces. Appropriate abrasive blaster's protective equipment is required, which may also include gloves, hood with protective lens, safety glasses, and hearing protection.

SECTION IX - SPECIAL PRECAUTIONS

Keep product dry and free of all contamination to assure free flow. Use an

appropriate safety screen over fill hatch of blasting pot. Respirable dusts may be generated during pressure abrasive cleaning operations.

-NOTE-

The opinions expressed herein are those of qualified experts within Harsco Corporation. Harsco believes that the information contained herein is current and accurate for the normal and intended use of this product as of the date of this Material Safety Data Sheet. Since the use of this information and of those opinions or the conditions of use of the product are not within the control of Harsco Corporation, it is the user's obligation to determine and observe the conditions of safe use and disposal of the product by their operations.

(RM 9/89)

ASHLAND PETROLEUM COMPANY
DIVISION OF ASHLAND OIL, INC.
P.O. BOX 391, ASHLAND, KENTUCKY 41101
(606) 329-3333

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD)

24-HOUR EMERGENCY TELEPHONE: 1-800-ASHLAND OR 1-800-274-5263

****

PRODUCT NAME: LPA AC 20
CAS NUMBER: 8052-42-4

DATA SHEET NO: 0060778-006.007
PREPARED: 01/17/95
SUPERSEDES: 11/22/94
PRINT DATE: 01/31/95

SECTION I-PRODUCT IDENTIFICATION

GENERAL OR GENERIC ID: PETROLEUM ASPHALT
DOT HAZARD CLASSIFICATION: NOT APPLICABLE

SECTION II-COMPONENTS

IF PRESENT, IARC, NTP AND OSHA CARCINOGENS AND CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III SECTION 313 ARE IDENTIFIED IN THIS SECTION.
SEE DEFINITION PAGE FOR CLARIFICATION

INGREDIENT	PERCENT	NOTE
ASPHALT CAS #: 8052-42-4	100 TLV: 5 MG/M3	(1)

(1): PEL NOT ESTABLISHED FOR THIS MATERIAL
TLV: AS FUMES.

SECTION III-PHYSICAL DATA

PROPERTY	REFINEMENT	MEASUREMENT
BOILING POINT	FOR PRODUCT	> 775.00 DEG F (412.77 DEG C) @ 760.00 MMHG

CONTINUED ON PAGE: 2

SECTION III-PHYSICAL DATA (CONTINUED)

PROPERTY	REFINEMENT	MEASUREMENT
VAPOR PRESSURE	FOR PRODUCT	0.00 MMHG @ 77.00 DEG F (25.00 DEG C)
SPECIFIC VAPOR DENSITY		HEAVIER THAN AIR
SPECIFIC GRAVITY		1.030 @ 77.00 DEG F (25.00 DEG C)
PERCENT VOLATILES		<3%
EVAPORATION RATE		SLOWER THAN ETHER
APPEARANCE		BLACK
STATE		LIQUID
FORM		MOLTEN

SECTION IV-FIRE AND EXPLOSION INFORMATION

FLASH POINT(COC) > 625.0 DEG F (329.4 DEG C)

EXPLOSIVE LIMIT UNAVAILABLE

EXTINGUISHING MEDIA: REGULAR FOAM OR CARBON DIOXIDE OR DRY CHEMICAL

HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM:, CARBON DIOXIDE AND CARBON MONOXIDE, VARIOUS HYDROCARBONS, SULFUR OXIDES, ETC.

FIREFIGHTING PROCEDURES: WEAR A SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE DEMAND MODE WITH APPROPRIATE TURN-OUT GEAR AND CHEMICAL RESISTANT PERSONAL PROTECTIVE EQUIPMENT. REFER TO THE PERSONAL PROTECTIVE EQUIPMENT SECTION OF THIS MSDS.

SPECIAL FIRE & EXPLOSION HAZARDS: NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY.

NFPA CODES: HEALTH- 1 FLAMMABILITY- 1 REACTIVITY- 1

CONTINUED ON PAGE: 3

SECTION V-HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE 5 MG/M3

EFFECTS OF ACUTE OVEREXPOSURE:

EYES - EXPOSURE MAY CAUSE MILD EYE IRRITATION. SYMPTOMS MAY INCLUDE STINGING, TEARING, AND REDNESS.
CONTACT WITH MOLTEN MATERIAL CAUSES THERMAL BURNS.
SOME ASPHALT PRODUCTS CONTAIN SULFUR COMPOUNDS WHICH MAY FORM HYDROGEN SULFIDE WHEN HEATED.
HYDROGEN SULFIDE PARALYZES THE RESPIRATORY SYSTEM RAPIDLY CAUSING UNCONSCIOUSNESS AND DEATH. SINCE HYDROGEN SULFIDE DEADENS THE SENSE OF SMELL, DO NOT RELY ON ODOR FOR WARNING.
SKIN - EXPOSURE CAUSES SKIN IRRITATION. SYMPTOMS MAY INCLUDE REDNESS, BURNING, AND SKIN DAMAGE. PRE-EXISTING SKIN DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS MATERIAL.
CONTACT WITH MOLTEN MATERIAL CAUSES THERMAL BURNS.
BREATHING - EXPOSURE IS POSSIBLE UNDER CERTAIN CONDITIONS OF HANDLING AND USE (E.G., DURING HEATING, SPRAYING, OR STIRRING).
SYMPTOMS MAY INCLUDE:
-IRRITATION (NOSE, THROAT, RESPIRATORY TRACT)- PRE-EXISTING LUNG DISORDERS, E.G. ASTHMA-LIKE CONDITIONS, MAY BE AGGRAVATED BY EXPOSURE TO THIS MATERIAL.
SWALLOWING - SINGLE DOSE ORAL TOXICITY IS LOW. SWALLOWING SMALL AMOUNTS DURING NORMAL HANDLING IS NOT LIKELY TO CAUSE HARMFUL EFFECTS; SWALLOWING LARGE AMOUNTS MAY BE HARMFUL.
SYMPTOMS MAY INCLUDE:
-GASTROINTESTINAL IRRITATION (NAUSEA, VOMITING, DIARRHEA)-

FIRST AID:

IF ON SKIN: IF SKIN CONTACT WITH MOLTEN MATERIAL OCCURS, FLUSH EXPOSED AREA WITH COLD WATER. DO NOT FORCIBLY REMOVE MATERIAL ADHERING TO THE SKIN. SEEK IMMEDIATE MEDICAL ATTENTION.
IF IN EYES: IF SYMPTOMS DEVELOP, IMMEDIATELY MOVE INDIVIDUAL AWAY FROM EXPOSURE AND INTO FRESH AIR. FLUSH EYES GENTLY WITH WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS APART; SEEK IMMEDIATE MEDICAL ATTENTION.
IF SWALLOWED: DO NOT INDUCE VOMITING. CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.
IF BREATHED: IF SYMPTOMS DEVELOP, IMMEDIATELY MOVE INDIVIDUAL AWAY FROM EXPOSURE AND INTO FRESH AIR. SEEK IMMEDIATE MEDICAL ATTENTION; KEEP PERSON WARM AND QUIET. IF PERSON IS NOT BREATHING, BEGIN ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN.

PRIMARY ROUTE(S) OF ENTRY:

SKIN CONTACT, INHALATION

CONTINUED ON PAGE: 4

SECTION V-HEALTH HAZARD DATA (CONTINUED)

EFFECTS OF CHRONIC OVEREXPOSURE:

THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS DETERMINED THERE IS SUFFICIENT EVIDENCE FOR THE CARCINOGENICITY OF EXTRACTS OF STEAM-REFINED BITUMENS,AIR-REFINED BITUMENS AND POOLED MIXTURES OF STEAM- AND AIR-REFINED BITUMENS IN EXPERIMENTAL ANIMALS. ASPHALT PRODUCTS, PROPERLY HANDLED AS OUTLINED IN THIS MSDS, ARE NOT EXPECTED TO CAUSE CANCER IN HUMANS. SKIN CONTACT, BREATHING OF MISTS, FUMES OR VAPORS SHOULD BE REDUCED TO A MINUMUM TO AVOID ANY ILL EFFECTS.

SECTION VI-REACTIVITY DATA

HAZARDOUS POLYMERIZATION: CANNOT OCCUR
STABILITY: STABLE
INCOMPATIBILITY: AVOID CONTACT WITH:, STRONG OXIDIZING AGENTS

SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILL: ABSORB LIQUID ON VERMICULITE, FLOOR ABSORBENT OR OTHER ABSORBENT MATERIAL.
LARGE SPILL: PREVENT RUN-OFF TO SEWERS, STREAMS OR OTHER BODIES OF WATER. IF RUN-OFF OCCURS, NOTIFY PROPER AUTHORITIES AS REQUIRED, THAT A SPILL HAS OCCURED.
PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED.SHOVEL MATERIAL INTO CONTAINERS. REMAINING MATERIAL MAY BE TAKEN UP WITH SAND, CLAY, EARTH, FLOOR ABSORBENT OR OTHER ABSORBENT MATERIAL AND SHOVELED INTO CONTAINERS.

WASTE DISPOSAL METHOD:

SMALL SPILL: DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
LARGE SPILL: DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.

CONTINUED ON PAGE: 5

SECTION VIII-PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT OR ANY COMPONENT IS EXCEEDED (SEE SECTION II), A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR IS ADVISED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL. OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MSHA RESPIRATORS (NEGATIVE PRESSURE TYPE) UNDER SPECIFIED CONDITIONS (SEE YOUR INDUSTRIAL HYGIENIST). ENGINEERING OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.
VENTILATION: PROVIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST) VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).
PROTECTIVE GLOVES: WEAR RESISTANT GLOVES SUCH AS:, NEOPRENE
EYE PROTECTION: CHEMICAL SPLASH GOGGLES IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER TYPE SAFETY GLASSES. CONSULT YOUR SAFETY REPRESENTATIVE.
OTHER PROTECTIVE EQUIPMENT: TO PREVENT REPEATED OR PROLONGED SKIN CONTACT, WEAR IMPERVIOUS CLOTHING AND BOOTS.

SECTION IX-SPECIAL PRECAUTIONS OR OTHER COMMENTS

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THIS DATASHEET MUST BE OBSERVED.
THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH THE COMPANY OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

SECTION X-LABEL INFORMATION

WARNING!
MAY CAUSE EYE AND SKIN IRRITATION.
CONTACT WITH MOLTEN MATERIAL MAY CAUSE THERMAL BURNS.
INHALATION OF FUMES MAY CAUSE IRRITATION OF NASAL AND RESPIRATORY PASSAGES.
MAY FORM HYDROGEN SULFIDE (H2S) WHEN HEATED. H2S PARALYZES THE RESPIRATORY SYSTEM AND MAY CAUSE DEATH. H2S DEADENS THE SENSE OF SMELL. DO NOT DEPEND ON ODOR FOR WARNING.
SWALLOWING MAY CAUSE MOUTH AND GASTROINTESTINAL IRRITATION.

HANDLING & STORAGE:

CONTINUED ON PAGE: 6

SECTION X-LABEL INFORMATION (CONTINUED)

AVOID CONTACT WITH EYES AND SKIN. USE OR STORE ONLY WITH ADEQUATE VENTILATION. WEAR SAFETY GLASSES OR GOGGLES, RESISTANT GLOVES, AND OTHER APPROPRIATE PROTECTIVE EQUIPMENT ESSENTIAL FOR YOUR OPERATION. MINIMIZE EXPOSURE THROUGH GOOD HYGIENIC PRACTICES. DO NOT TRANSFER TO UNLABELED CONTAINER. DO NOT USE CUTTING OR WELDING TORCH ON THIS CONTAINER (EVEN EMPTY). BEFORE USE, REVIEW MATERIAL SAFETY DATA SHEET FOR MORE DETAILED INFORMATION, INCLUDING CHRONIC HEALTH EFFECTS. 24-HOUR EMERGENCY NUMBER 1-800-ASHLAND.

FIRST AID:

EYES: FLUSH THOROUGHLY WITH WATER. GET MEDICAL ATTENTION IMMEDIATELY.
SKIN: SHOULD MOLTEN MATERIAL STRIKE THE SKIN, FLUSH WITH COLD WATER. DO NOT FORCIBLY REMOVE MATERIAL ADHERING TO THE SKIN.THOROUGHLY WASH EXPOSED AREA WITH MINERAL OIL. GET MEDICAL ATTENTION IMMEDIATELY.
INHALATION: IF AFFECTED, REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, GET MEDICAL ATTENTION.
INGESTION: DO NOT INDUCE VOMITING. CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

CHRONIC INFORMATION:

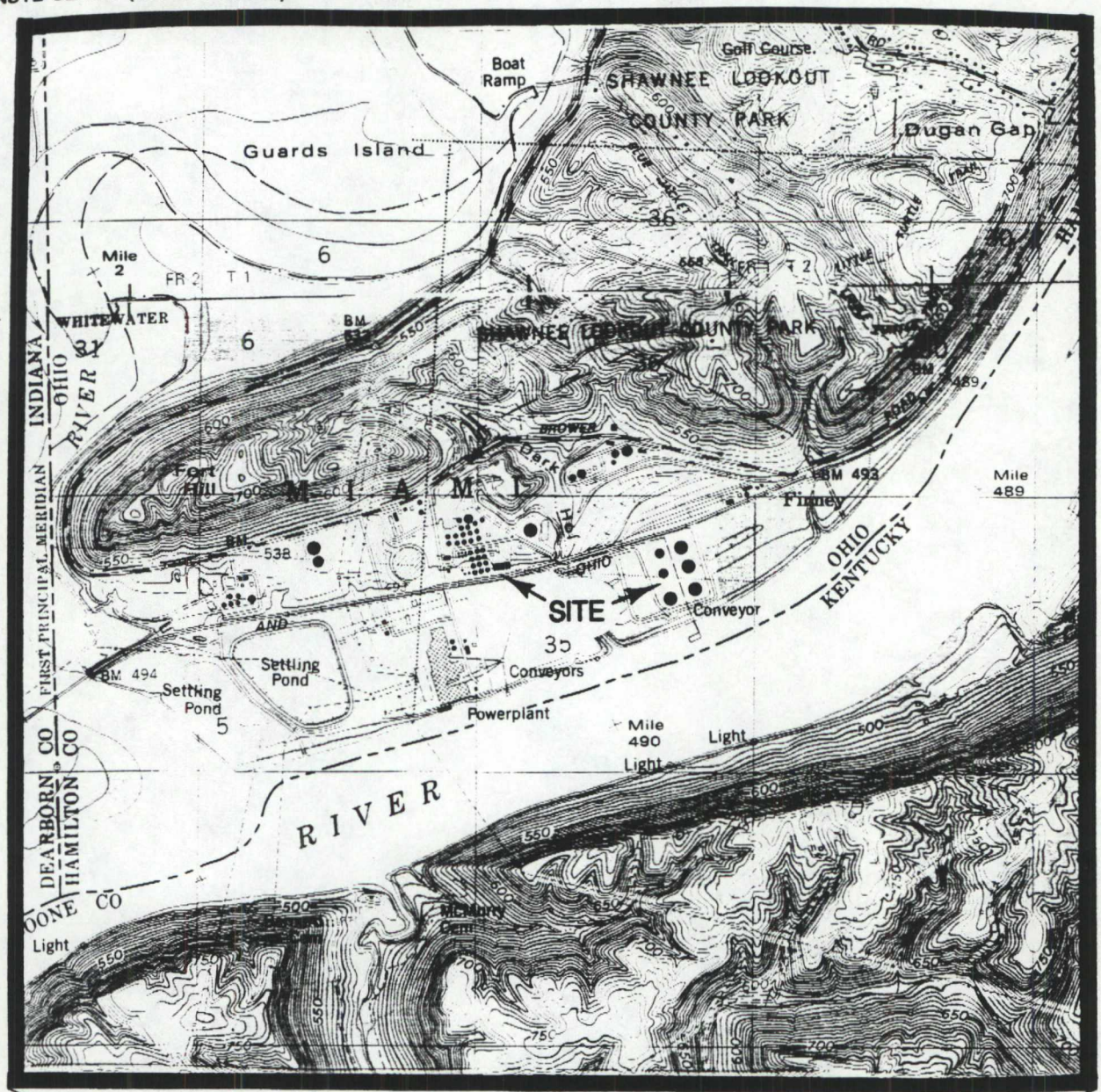
CONTAINS: ASPHALT

*** COMPONENTS APPEAR IN SECTION II ***

LAST PAGE----------LAST PAGE

FIGURES

SOURCE:
U.S. GEOLOGICAL SURVEY
HOOVEN, OHIO-IND.-KY. &
LAWRENCEBURG, IND.-OHIO-KY. QUADRANGLES, 1981
7.5 MINUTE SERIES (TOPOGRAPHIC)



DRAWN BY HMD CHECKED BY DWS

ASHLAND PETROLEUM COMPANY CHEVRON-CINCINNATI ASPHALT TERMINAL PROJECT NO. 53-1538	LAW ENVIRONMENTAL, INC. LOUISVILLE, KENTUCKY	SITE LOCATION MAP FIGURE 1

N52329